

**Armed Forces Pest Management Board**

**TECHNICAL INFORMATION MEMORANDUM NO. 38**



**PROTECTING MEAL, READY-TO-EAT RATIONS  
(MREs) AND OTHER SUBSISTENCE  
DURING STORAGE**



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Acknowledgments .....	ii
Disclaimer .....	ii
Foreword .....	ii
<b>PART I. INSTALLATION PROGRAMS</b>	
Instituting an Integrated Pest Management Program .....	1
Initial Inspection .....	1
Structural Design/Pest Exclusion .....	1
Sanitation/Housekeeping .....	3
Stock Handling Practices .....	3
Pest Exclusion Methods .....	4
Nonchemical Control Methods .....	5
Chemical Control Methods .....	5
Inspection/Survey/Monitoring Techniques .....	6
<b>PART II. SHIPBOARD PROGRAMS</b>	
Introduction .....	8
Landing Force Operational Reserve Materiel (LFORM) .....	9
U.S. Marine Corps and U.S. Army Prepositioned Stocks .....	9
Stacking Requirements .....	9
Pest Management Guidelines .....	10
REFERENCES .....	13

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### Disclaimer

Trade names are used in this TIM to provide specific information and do not imply endorsement of the products named or criticism of similar ones not mentioned. Mention of trade names does not constitute a guarantee or warranty of the products by the AFPMB, the Military Services, or the Department of Defense (DoD).

### Foreword

This Technical Information Memorandum (TIM) implements guidance for the protection of Meal, Ready-to-Eat (MRE) Combat Rations owned or under the custody of military installations and forces consistent with the references listed at the end of this document. Historically there have been few incidents of MRE infestation/damage by insects or rodents. However, the 10 mil polyethylene bags used for MRE rations are susceptible to insect and rodent attack and damage. Until different packaging is used for the rations, pest prevention measures must be taken ashore and afloat to protect them. Currently, MRE rations are stored in dry storage (ambient temperature) warehouses; refrigerated/cold storage facilities, both above and below ground; and aboard ships including the Maritime War Reserves (MWR). Furthermore, the rations are included in the Marine Corps Landing Force Operational Reserve Materials (LFORM) which, under the present situation, are stored for extended periods of time on board ships below deck and usually in areas inaccessible for thorough inspection. Since temperature and humidity conditions in shipboard storage are highly conducive to development of stored product pests, action must be taken to prevent infestation prior to and during storage aboard ship. Parts I and II of this TIM provide pest control measures for the two broad MRE storage situations: ashore and aboard ship. Although this TIM is geared to MRE storage, most of the information in the TIM also applies to other stored subsistence.

## PART I. INSTALLATION PROGRAMS

### 1. Instituting an Integrated Pest Management Program.

Establish protection of MRE rations through integrated pest management (IPM), which involves a combination of chemical and non-chemical prevention and control strategies. Portions of the IPM program may not be applicable to cold storage facilities. The basic IPM program for MREs includes:

- A. Initial inspection of goods and premises, identification of problem areas, and identification of pests present.
- B. Application of pest management techniques:
  - (1) Structural design and pest exclusion.
  - (2) Sanitation and housekeeping.
  - (3) Stock handling practices.
  - (4) Nonchemical control and exclusion methods.
  - (5) Chemical control methods.
- C. Ongoing inspections of goods and premises and pest monitoring to continually evaluate the program and correct problem areas.

The success of any IPM program is dependent upon communication and cooperation between warehouse management, medical, veterinary and entomological personnel, and military or civilian pest control operators. The responsibilities for each element of the program overlap, thus, the breakdown of any element can jeopardize the program.

### 2. Initial Inspection.

A joint inspection between pest management consultant(s) (PMC) and warehouse management personnel will be performed to identify problem areas and to review current practices. The PMC will discuss techniques for effective pest management and pinpoint deficient areas per Section I of DLAR 4155.37 (Reference (f)). Immediately following the inspection, the PMC and warehouse management personnel will discuss problem areas and develop a working plan and goals to correct deficiencies or shortcomings.

### 3. Structural Design/Pest Exclusion.

Proper structural design and other techniques can prevent or minimize insect, rodent and bird entry into warehouses and storerooms, thereby, minimizing the additional time and resources needed to remove them.

A. Outside Grounds.

- (1) Eliminate all heavy weed growth and debris near the storage facility. These items provide breeding sites and cover for insects and rodents, and make locating and treating rodent burrows more difficult.
- (2) Empty refuse receptacles and pick up trash daily.
- (3) Stack surplus pallets well away from the warehouse building, as they often provide harborage for rodents and insects.
- (4) Use yellow or sodium vapor exterior to reduce insect attraction.
- (5) Keep garbage areas well organized and free of litter to prevent rodent harborage and enable observation during rodent surveys.
- (6) Consider insect pheromone monitoring outside of the building.

B. Buildings.

- (1) Repair holes existing in or under walls, and seal all cracks around door jams or at the wall-ground junction with concrete or other suitable material.
- (2) Maintain tight closure of doors - the gap along bottom and sides should not exceed ¼ inch. Keep doors closed when not in actual use. If railroad tracks run into the warehouse, a block or plate should be attached to the door to fill the gap next to the track itself.
- (3) Seal utility lines and chases where they enter the building.
- (4) Cover operable windows and air ducts with 16-mesh screening.
- (5) Cover exhaust fans with operable louvers and/or 16-mesh screening.
- (6) Appropriately screen or cover floor drains and heating/cooling vents with ¼ inch mesh to prevent rodent access. Seal nonfunctioning floor drains.
- (7) Properly seal expansion joints and other joints or cracks to eliminate pest entry or harborage.

C. Warehouse Interior.

- (1) If the loading dock is not of solid construction, keep the area beneath it open, accessible and clean. Keep the dock itself free of debris, excess pallets, and packing materials, which can provide pest harborage.
- (2) Maintain a minimum of 46 cm (18") perimeter clearance between walls and shelves or pallets.
- (3) Store packing material in repack areas off the floor; store tools and parts in mechanical and recharging areas similarly.
- (4) Provide lockers for employee storage of personal items and lunches.

#### 4. Sanitation/Housekeeping.

Proper sanitation and housekeeping efforts will substantially reduce pest food sources and harborage, as well as facilitate effective chemical and non-chemical control measures. Good sanitation practices include:

- A. Promptly clean up spillage of stored commodities.
- B. Repair or remove and dispose of broken food containers and packages, especially in salvage and recoupment areas. Thoroughly cleaning metal or plastic refuse containers located in the recoupment area as frequently as necessary with hot water or steam. Use disposable liners in refuse containers to minimize cleaning frequency.
- C. Use snug-fitting covers or lids for refuse containers. Additionally, empty refuse containers, vacuum cleaner bags, or receptacles daily. Clean containers as frequently as necessary.
- D. Sweep floors regularly, with special attention to the removal of debris, which accumulates around posts, shelf legs, and pillars. Use an industrial vacuum sweeper to thoroughly clean warehouses and storerooms containing subsistence assets. Empty stock locations should be swept prior to new stock placement. This applies for trailers, containers, government-owned vans and rail cars to be loaded with MREs.
- E. Notify pest control and immediately clean up rodent droppings when discovered; also, inspect commodities, packaging, pallets, and floors for contamination by urine or other filth. Note: Special precautions may be necessary in certain regions; refer to MILSTD 904B (Reference (i)).
- F. Maintain pallets and keep them clean and free of debris.
- G. Ensure that rail cars and truck vans are clean and without holes, both before they are loaded and shipped, and upon receipt.
- H. Through warehouse management prohibit eating, drinking and/or smoking, except in designated areas. Remove empty food tins or half eaten containers of food behind or underneath pallets, and in other out-of-the-way places. Such items are powerful pest attractants.
- I. Keep all rest rooms and "break" or lunch areas clean.

#### 5. Stock Handling Practices.

Certain stock handling practices have been effective at reducing the potential food supply and harborage for pests:

- A. Inspect incoming products to ensure they are pest free when received. Refuse receipt of any infested products. See Section I of DLAR 4155.37 (Reference (f)).
- B. Store MRE rations separate from commissary and fleet/troop issue food items to the maximum extent feasible, except when stored under refrigeration.
- C. Avoid combining different products on the same pallet.
- D. Consolidate items on pallets as compactly as possible to eliminate rodent hiding places.

- E. Rotate stock properly. Proper stock rotation is critical; the older a product, the more likely it is to be infested. Base rotation on the date of pack of the item, rather than the date the item was received in the warehouse or storeroom, unless food inspection personnel indicate otherwise. Management must be aware of the turnover time on various items in order to reduce the likelihood of overstocking, and consequent over-aging of products.
- F. In locations where MRE rations are collocated with commissary or troop issue items, conduct a thorough inspection of the most highly infestible commodities (e.g. dry pet food) to determine whether or not an infestation exists. Conduct the same inspection on all other infestible commodities shortly thereafter. The following items are subject to infestations:

- |                             |           |               |              |
|-----------------------------|-----------|---------------|--------------|
| (1) Dry Pet Food            | (4) Pasta | (7) Cookies   | (10) Cereals |
| (2) Flour and Bakery Mixes* | (5) Candy | (8) Cornmeal  | (11) Spices  |
| (3) Nuts and Dry Fruit      | (6) Grits | (9) Dry Beans | (12) Rice    |

\*(Note: Canned flour and bakery mixes are subject to packaging infestation because of product dust/residue on the cans and in the cases.)

- G. Food items, other than MREs, found to be infested with insects should be isolated as quickly as possible and fumigated (See AFPMB TIM-11, (Reference (g)), and fumigant manufacturer's labeling). If this cannot be done within 24 hours, cover the infested commodity with plastic and seal the plastic to the floor with tape. It will serve as a temporary means of minimizing contamination of other products. If all of the above are impossible, place the infested commodity in refrigerated storage. The fumigation of MRE rations is not recommended and will only be done if no other options are available, and only after consultation with a Defense Supply Center, Philadelphia (DSCP) entomologist. Reworking the MRE cases, placing the rations under refrigeration or freezing are preferred options. If rations are frozen, they must be thawed prior to handling to avoid damage to the packaging and compromising food safety.
- H. Ensure that supervisors encourage caution among forklift operators. Most spillage and commodity damage is caused by careless operations. Special care must be taken with soft packaged items, such as flour, sugar, and rice.

#### 6. Pest Exclusion Methods.

These methods are designed to exclude pests from storage environments and prevent their establishment:

- A. Plastic or wire screening attached or suspended beneath warehouse structural framing and overhangs can be an effective means of excluding birds from access to roosting or nesting sites.

- B. Screening (16-mesh) over windows on outside walls is an effective way to prevent bird entry through operable windows.
- C. Large doorways leading to outside access should be tight-fitting and have no gaps larger than  $\frac{1}{4}$  inch on any edge when the door is closed. If these doorways are left open for extended periods, they should be fitted with full length plastic strips or air curtains to discourage and prevent pest entry.
- D. Electronic, magnetic, and sonic devices are neither effective nor authorized for rodent or bird control (Reference (j)).

#### 7. Nonchemical Control Methods.

These methods are designed to control pest infestations by catching, killing, or excluding the pest without the use of pesticides. Warehouse design must be considered from the standpoint of control and exclusion.

- A. Repeating traps and snap traps are used for rodent control around the inside perimeter of the warehouse. They are set at regular intervals (distance will vary depending on the potential for rodent activity and the type of rodent normally encountered), or within stacks in high susceptibility areas such as those used for pet food, rice, and flour storage. Traps should be checked at least weekly, or daily if activity is observed. It is possible to have either a warehouse worker or food inspector check traps during the interval between routine pest control visits. They should notify pest control of any activity found.
- B. Glue boards may be used for rodent control and should be placed in the same manner as traps on the natural rodent runs. Note: They can also be used for monitoring for some insects.
- C. Eliminate unnecessary water sources readily available to rodents. This will also improve the effectiveness of liquid rodenticides.
- D. Repellent glues may be used to keep birds off roosting points, if they cannot be entirely excluded. In some situations, slip sheets (cardboard sheets used between the pallet base and load) or plastic may be placed on top of pallets to protect products from contamination.
- E. Insect pheromone traps, New Jersey style light traps, and insect electrocutors, while not effective as the only type of control measure when used alone, do provide surveillance of insect populations. Pheromone traps may be used outside of a storage facility, away from the building, to monitor outside pest insect populations and intercept pest insects before they can enter the facility.

#### 8. Chemical Control Methods.

Chemical pesticides are used to prevent or control insect, rodent, and bird infestations.

- A. Ensure that all pesticide applicators are trained, certified, or appropriately licensed to apply pesticides.
- B. When necessary, use ULV fogging machines with an approved insecticide as a warehouse space treatment during nonduty hours. Specific recommendations shall be obtained from the responsible pest management consultant and shall be based upon surveillance results.
- C. Apply crack and crevice residual pesticides (approved for food processing establishments) monthly in dry storage warehouses or similar facilities. **The frequency of application should be adjusted, reduced or increased, based on surveillance results; however, it shall not exceed label recommendations.** Residual insecticides should not be applied in cool or wet cave storage facilities unless specifically advised by a pest management consultant.
- D. Dry rodenticide bait may be used in storage environments in appropriate bait stations. Rodent bait stations are placed along the inside warehouse perimeter, as well as at points of evident need based on surveys. Mechanical traps, both windup and snap, may be used along interior walls (e.g. fire walls) in place of bait stations. Place rodent control devices only in locations that are accessible for inspection and servicing, and are protected from careless operations which may damage them. Stations should be checked at least monthly for rodent activity, and old bait material completely replaced with new bait, at regular intervals. Bait stations should be used outside all storage facilities, as well as inside wet caves, at intervals of 50 feet (15 meters) or closer. Bait stations placed outside must be tamperproof. Baits must be protected from mechanical damage and be readily accessible to the rodent population. If rodent activity is noted indoors, both liquid bait stations and mechanical traps should be used to supplement dry rodenticide baits and the frequency of monitoring increased.
- E. Rodent tracking stations can be used outside the storage facility, and are especially effective for rapid reduction of high rodent populations.
- F. Routine fumigation of MRE rations is prohibited. MRE fumigation will be performed only as noted in paragraph 5G.
- G. To eliminate active infestations and prevent the spread of insects to MREs or other commodities, fumigate any product in which there is evidence (direct or indirect) of insect infestation. Fumigation should be accomplished in place, if possible, and as promptly as possible.

9. Inspection/Survey/Monitoring Techniques.

- A. Conduct thorough veterinary/entomological/pest control commodity inspections for possible infestations. Emphasize receipt inspections.
- B. Conduct, as a minimum, monthly veterinary/preventive medicine/pest management inspections of sanitary conditions both inside and outside warehouses. If no critical deficiencies are reported, documented sanitary inspections are required quarterly. Sanitary problems shall be reported when observed. Reported problems should be monitored until corrected.

- C. Effective inspection techniques are the keys to getting the IPM program properly started and are essential in monitoring and maintaining the program's efficiency. To conduct a proper inspection, the inspector needs several items, such as a flashlight, pocket knife for opening boxes, clipboard, paper, pen, and tape for resealing boxes. In addition, the inspector may want to carry chalk for marking infested pallets, a magnifying hand lens to aid in initial insect identification, and a mirror on an extendable handle for inspecting difficult to reach locations. Also, a portable blacklight is useful in determining rodent contamination, as rodent urine fluoresces under ultraviolet light.
- D. During receipt inspections of foods, the inspector should note the condition of boxes and pallets and look for actual infestations in the food product itself. Over-aged items and products in severely deteriorated or damaged containers should be viewed with suspicion; where possible, such items shall be returned to the shipper. Do not place infested products in the food warehouse. The conveyance should also be inspected for evidence of insect or rodent infestation; such evidence may be grounds for rejection of the products. Shipments of MREs showing evidence of infestation shall be reported to DSCP immediately for pest management guidance.
- E. During the initial preprogram inspection, as well as during follow-up inspections, the inspector should note general sanitation levels, structural discrepancies, and signs of rodent or insect infestations. Inspection results shall be communicated to the activity commander and warehouse management, as well as any other involved agency such as Public Works or Maintenance. That is necessary so that deficiencies may be corrected promptly to ensure an effective program.
- F. Insect and other arthropod (mite) identifications must be supported by confirmation from a pest management consultant, the supporting medical laboratory, the Navy Environmental Health Center, a Navy Disease Vector Ecology and Control Center, Navy Environmental and Preventative Medicine Unit; or the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM).
- G. The following guidelines are helpful to inspectors in identifying insect and rodent infestations:
  - (1) Rodents.
    - (a) Look for droppings, urine stains, rub marks, gnawing, and shredded nesting materials on, in, and under palletized goods. Rodents may infest the interior of palletized goods, especially if held for long periods in the warehouse before issue.
    - (b) Do not confine inspection to pallets of edible foods; rodents will nest with equal facility in pallets of canned goods or paper products.
    - (c) In heavy infestations, the odor of rodents provides a valuable clue to their location.

(2) Insects.

- (a) Note the number and type of dead insects on floors, ledges, and window sills, as well as any live insects crawling on or flying around commodities.
- (b) If New Jersey style or similar light traps are used, their contents must be checked weekly for the number and species of insects. The responsible pest management consultant should identify these insects.
- (c) Pheromone traps are recommended and may be used at the discretion of the responsible pest management consultant. Technical Information Memorandum No. 27, Stored Product Pest Monitoring Methods, (Reference (h)), provides guidance on their use.
- (d) Check infestible food products by moving a layer or two of packages off the top of the pallet and look closely for insects on package surfaces or in cracks and folds between packages. Insects infesting food products will usually be found on the underside of plastic bags, in and along folds and seams of bagged commodities, in the bottom of cartons and sacks, or underneath carton or box flaps. The existence of "frass" or silk in or on a product or chewed entry or exit holes are clues to an infestation, even if actual insects are not immediately seen.

## PART II. SHIPBOARD PROGRAMS

### 1. Introduction.

A. General. The Meal, Ready-to-Eat (MRE) is a combat ration packaged in a 10 mil polyethylene bag which is strong and lightweight, but can be penetrated by rodents and certain insects. Under the confined conditions found aboard ship, MREs may be at risk to infestation or damage by those pests. Because of the critical importance of the MRE in future contingency operations, it is essential that ship commanders ensure these rations are protected through an effective shipboard pest management program.

### B. Ships Carrying MREs.

- (1) The MRE rations are stocked aboard Navy ships when specifically authorized by a fleet commander and the Navy Food Service System Office. For example, an LSD may requisition MREs to feed the ship's landing party during training or field exercises. In that situation, the rations will be found in the food service storerooms and will be the responsibility of the supply department. Additionally, the Marines and the U.S. Army store pre-position MRE stocks aboard contract vessels and USNS vessels (Military Sealift Command).
- (2) Navy replenishment and USNS vessels may carry MREs, some of which will be transported in refrigerated spaces. Certain types of amphibious assault ships have

been designed to carry large quantities of MREs under a program called Landing Forces Operational Reserve Materials, or LFORM. The very nature of the program renders the MRE vulnerable to invasion by insects and rodents.

2. Landing Force Operational Reserve Materiel (LFORM).

- A. Concept of LFORM. LFORM are part of Marine Corps Pre-positioned War Reserves Materiel stocks and are maintained aboard selected amphibious warfare ships to provide support for embarked troops in contingencies. Embarked Marines aboard for training operations will not draw stocks from LFORM. The combat cargo officer is responsible for LFORM stocks, not the supply officer.
- B. Ship Types Carrying LFORM MREs. MRE rations for a Marine Expeditionary Unit (MEU) will be pre-positioned and stored in secure spaces aboard each LPH, LHA, LPD and LKA. Designated ships each receive and hold five to seven thousand cases, with 12 rations per case. Note: For most pre-position situations the MREs are stored in certified containers (sealed containers, no openings/vents). As long as the MREs are pest free when the containers are loaded, and the containers are tight, there should be no pest problems. Additionally, once staged aboard the pre-position ships the MREs are not readily accessible.
- C. Palletizing MREs in LFORM. MREs are palletized and banded on standard 40" x 48" wooden pallets. There are 48 cases/pallet.
- D. Rotation of MREs in LFORM. MREs have a 3 year shelf life under normal conditions. Current policy is to rotate MREs every deployment. Rotation will return MREs to supply channels for reissuing and consumption.

3. U.S. Marine Corps and U.S. Army Pre-positioned Stocks.

New production MRE rations are used for pre-positioned stocks. MREs are stored in containers aboard either contracted or chartered ships or USNS vessels maintained by the Military Sealift Command. Once placed aboard ship, the rations are not readily accessible and generally will not be inspected until the stocks are rotated off the ships. Some ships have containers equipped for remote monitoring of container conditions. The rations are stored for 30 months (U.S. Marine Corps) and 24 months (U.S. Army). When rotated, the rations are replaced with new rations to maintain the serviceability of the stocks. It is essential the containers receive a proper inspection prior to loading. Container integrity and cleanliness are key components of this program.

4. Stacking Requirements.

- A. Stacking. MREs shall be stacked no more than four (4) pallets high in a warehouse to prevent crushing the cases at the base of the stack. Continual vibration while underway will hasten the settling or crushing effects on the lower cases of MREs pallets. On

those ships having overhead clearance allowing stacking of MREs, it is recommended that stacks be no more than three (two preferred) pallets high. While other LFORM gear may be placed under the MREs, no items shall be placed over the MRE rations. MREs shall not be stacked over or immediately adjacent to petroleum products (oils, greases, fuels or solvents).

- B. Inspections. Marine Corps Service Support Group LFORM loading plans should allow accessibility to the MRE rations for stored product pest inspections by medical department personnel. In this situation, accessibility means sufficient space for an individual to closely inspect a minimum of one side and the top of the MREs as stacked on a pallet.
- C. Time and Temperature Guidelines. MREs stored in LFORM blocks can be expected to experience temperature ranges that allow them to last for at least one year. Studies by the U.S. Army, Natick Laboratory indicate the following time and temperature storage guidelines for MREs: seven years at 60°F, five years at 70°F, four years at 80°F, thirty months at 90°F, and five months at 110°F (See Reference (d)). Daily temperature logs should be kept on LFORM stowage areas where ordnance is held. Similarly, any spaces with MREs must also be monitored for temperature. The combat cargo officer should consider placing MREs in the coolest sections of the LFORM stowage spaces when designing the load plan.

5. Pest Management Guidelines.

- A. Initial Inspection and Treatment of LFORM MRE Stowage Spaces. The combat cargo officer must coordinate the initial inspection of storage space with the preventive medicine technician or Medical Department representative (MDR) prior to loading LFORM MRE rations. A meticulously thorough survey for any insect or rodent must be made at the time. Even if no insects or rodents are found, flawless sanitation and housekeeping practices will substantially reduce pest food sources and harborage, as well as facilitate chemical and nonchemical measures for any pest that may be introduced later. A high degree of sanitation is essential in all store rooms to prevent or limit infestations.

- (1) Thoroughly clean the entire stowage space where MREs are to be placed. Any nearby spaces which hold or have recently held foodstuffs or animal products (boots, blankets, brushes, wool uniforms, etc.) must receive similar attention. Remove debris from the ship after each cleaning.
- (2) Once a spotlessly clean stowage area is achieved, residual insecticide sprays can be applied, however, this treatment is not warranted unless pest activity was noted during clean up. The preventive medicine authority certified to apply pesticides or station pest control personnel shall use an approved residual insecticide. Residual sprays provide long lasting protection to noninfested stocks and prevent the spread of pests from previously infested stocks. Specific pesticide recommendation, rate,

and type of application must be obtained from the respective area medical entomologist.

- (3) If subsistence supplies are procured at overseas ports, ensure they receive a proper receipt inspection to prevent the introduction of stored product pests into ship storage areas.

B. Inspection of LFORM MREs Prior to Loading. Paragraph 4200 of Reference (c) states that stores received from military installations require only a quantity inspection. It further states that quality inspections are made by the supply activity upon acceptance of the material from the original supplier and will not be duplicated aboard ship. The receiving ship, however, may make inspections to detect any deterioration or breakage that may have occurred since the quality inspection. It is during this inspection that the Medical Department Representative must check closely for signs of insects and rodents. Receipt of stores from government installations other than military are to be inspected for both quantity and quality. Due to the absolutely critical importance of the LFORM MRE in future contingency operations, only stocks in good condition and free of defects should be accepted.

C. Loading of LFORM MREs. Loading can begin once the combat cargo officer has determined the quality and quantity of LFORM MREs, and that stowage spaces are properly prepared. Care must be taken to avoid damaging the rations during loading operations. Damaged cases with exposed foodstuffs must be removed from the pallet and repackaged. Prompt cleanup of spillage is essential. Supervisors must encourage caution and consciousness among forklift and elevator operations to avoid damage to these rations.

D. Routine Inspection Program for MREs Stored Aboard Ship.

- (1) Inspection of Ship's Company MREs. In those storerooms where MRE rations are collocated with ship's company food stuffs, the Medical Department should conduct a thorough monthly inspection of several of the most highly infestible commodities (flour, mixes, cornmeal, grits, pasta, cookies, cereals, spices, beans, nuts, and candy). Handle infestations detected as a result of those inspections per Reference (c).
- (2) LFORM MRE Inspection Program Requirements. Due to the absolutely critical nature of these rations, conduct intense surveillance of the LFORM MREs. Any insect life form found in these stowage spaces must initially be considered as a threat to the MRE. The combat cargo officer should coordinate with the medical officer to have designated Medical Department representatives conduct weekly inspections for stored product pests. The LFORM load plan must allow for reasonable access; otherwise, adequate inspections cannot be performed.
- (3) Surveillance Equipment. To conduct an adequate and thorough inspection, the inspector will need to carry several items, such as a flashlight, clipboard, paper,

pen, alcohol vials for preserving insect specimens, magnifying hand lens to aid in initial pest identification, and optionally, a portable black light to identify rodent urine.

- (4) The inspector should note the condition of pallets and cases, as well as look for actual infestations in the products stored adjacent to MREs. Damaged cases should be viewed with suspicion. Note: Open package inspection of MRE meals for insect infestation is not necessary nor is it recommended unless the pouch bag has been damaged or a special inspection has been requested.

(5) Rodent Inspection.

- (a) The MRE ration is vulnerable to rodent attack, especially in the LFORM configuration. Mice, for example, may be brought aboard in plywood boxes containing other materials in LFORM (burlap bags, ordnance, barbed wire, etc.).
- (b) Inattention to detail on the part of the inspector looking for rodents could have serious consequences. The inspector should look for droppings, urine stains, rub marks, gnawing, and shredded nesting materials on, in, and under palletized goods. Rats and mice may also infest the interior of palletized goods.
- (c) The inspector should not confine the search for rodents to the MRE rations. The pests will nest in nonfood pallets as well.

(6) Insect Inspection.

- (a) The inspector should note number and type of dead insects on the deck, as well as any live insects on or around pallets and packages.
- (b) Check the MREs by removing cases from the top of the pallet and looking closely for insects on package surfaces or in cracks or folds between packages. Insects may be found on the underside of plastic bags, in the bottom of cases, or between the box and the sides of the MRE case. The existence of "frass" or silk in or on the product or chewed entry or exit holes are clues to an infestation, even if actual insects are not immediately seen. Breaking open pallets of all MREs stowed aboard ship is not recommended.
- (c) Positive insect identification may be obtained from the nearest area medical entomologist or PMC listed in Reference (h).

E. Procedures When LFORM MREs are Infested by Insects.

- (1) Notify the combat cargo officer and medical officer.
- (2) Determine the extent of infestation and record lot numbers of MRE containers.
- (3) Remove all infested/damaged cases from the LFORM stowage space immediately, in order to minimize the possibility of infestation of "clean" supplies. Refrigerate cases, if possible, or dispose of them following current directives. When cases are

damaged during loading, the cases shall be replaced with undamaged cases from stock.

- (4) Contact the nearest Navy medical entomologist or PMC by phone or message for guidance and to transmit information on the lot numbers, condition and quantity of infested MRE rations. See Reference (h) for location of the nearest area entomologist.
- (5) No fumigation procedure for MREs or other food stores aboard ship is currently approved. MREs and other food stores found to be infested can be covered with plastic and the plastic sealed to the floor with tape to isolate the product. If possible the products should be placed in refrigerated storage. This will serve as a temporary means of minimizing cross contamination to other products. Local medical or veterinary representatives must then determine through ration breakdown which components can be salvaged.

F. Procedures When MREs are Infested by Rodents.

- (1) Light gangways well at night. Set traps and dispose of rodent carcasses following guidance provided in Reference (i). Check all traps during weekly inspections. When in port, rat guards must be utilized on all ship-to-shore lines on any vessel carrying MREs.
- (2) Rodent bait blocks made of paraffin are not recommended for use aboard ship for two reasons: (1) the grain bait in the paraffin block may be infested with insects during the manufacturing process and serve as foci for infesting the ship's stored products, and (2) any rodent poisoned by a bait block may die in an inaccessible area and cause unpleasant odors.
- (3) Glue boards may be useful for rodent control, especially in inaccessible areas. As with traps, locate the glue boards in natural rodent runs.
- (4) Remove damaged cases from storage. Pallets with damaged cases should receive 100% inspection of the cases to ensure there are no rodent nests present. Adjacent pallets should also be examined. A blacklight is useful for identifying rodent contaminated cases. Remove pouches from contaminated cases and destroy the cases. The pouches should be examined for damage or contamination.
- (5) MRE pouches that exhibit gnawing by rodents should be destroyed. Pouches with urine contamination can either be sanitized with a chlorine solution (Reference (i)) or destroyed as per Navy medical entomologist or local medical authority.

References

- (a) COMNAVSURFPACINST 4080.1/FMFPAC ORDER 4080.2 (NOTAL)
- (b) COMNAVSURFLANTINST 4080.1B/FMFLANT ORDER 4000.10B (NOTAL)
- (c) NAVSUP PUB 485, Afloat Supply Procedures. Revision 2, 15 Nov 89, with changes through 31 Jan 96.

- (d) DPSC Handbook 4155.2, Subsistence, Inspection of Meal, Ready-to-Eat (MRE) Rations, Appendix A.
- (e) DLAI 4145.31, Integrated Stored Products Pest Management, 9 May 1997.
- (f) DLAR 4155.37/TB 702-18, Appendix S, Materiel Quality Control Storage Standards, 24 Feb 93.
- (g) AFPMB Technical Information Memorandum No. 11, Hydrogen Phosphide Fumigation of Subsistence with Aluminum Phosphide.
- (h) AFPMB Technical Information Memorandum No. 27, Stored Product Pest Monitoring Methods.
- (i) MILSTD 904B, Department of Defense Standard Practice: Guidelines for Detection, Evaluation, and Prevention of Pest Infestation of Subsistence.
- (j) DoD Instruction 4150.7, DoD Pest Management Program, April 22, 1996.